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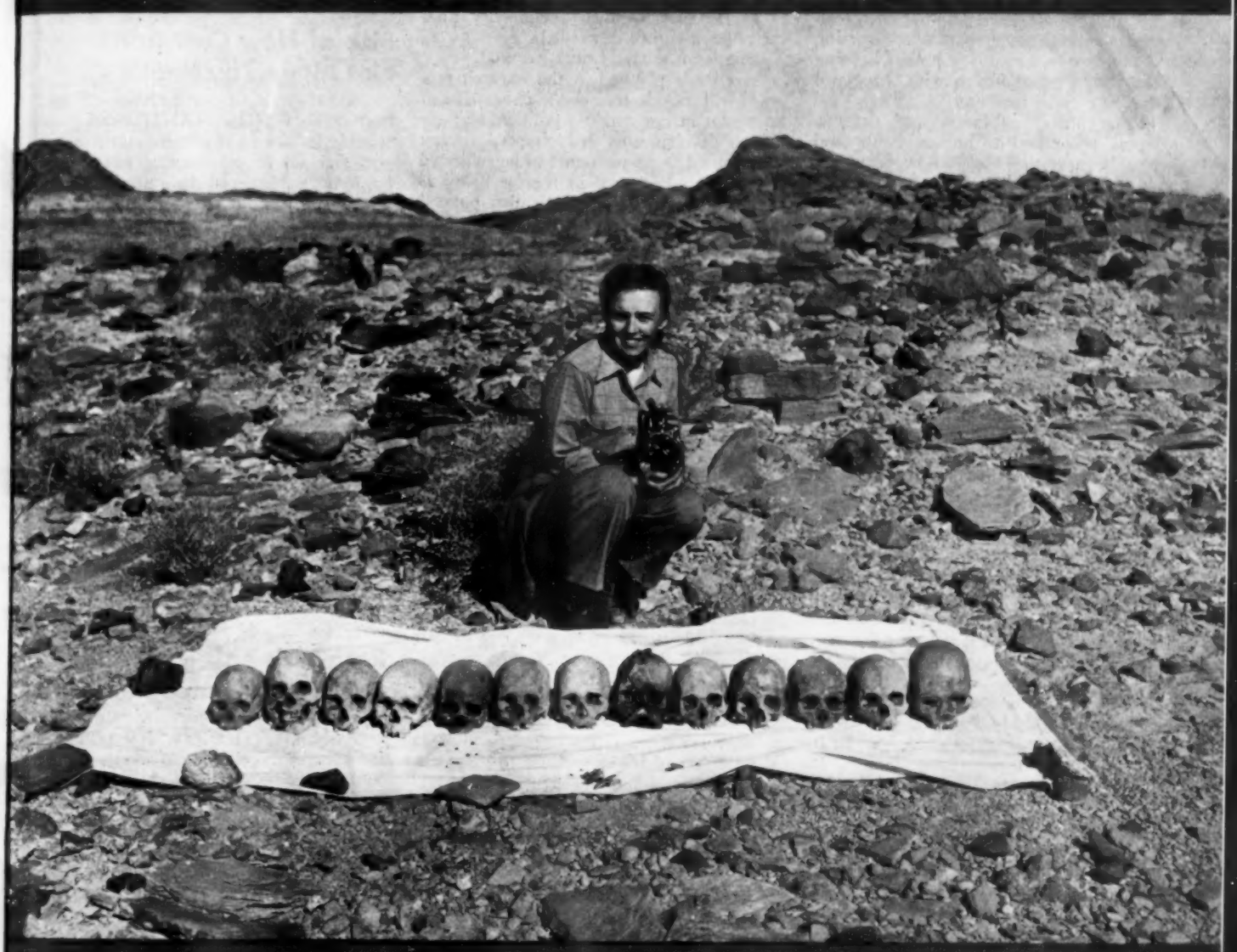
AUGUST 28, 1948

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Skulls of Sinai

See Page 138

A SCIENCE SERVICE PUBLICATION

VOL. 54 NO. 9

PHYSIOLOGY

Gage Bones' Elasticity

Study aimed at finding out how the human body behaves under different shock conditions. Discover human bones approximate elasticity of wood.

➤ ELASTICITY of human bones is about one-tenth that of steel, or about equal to the elasticity of wood.

This was discovered in tests made in a new research program at the National Bureau of Standards. The new study is aimed at finding out how the human body behaves under shock in airplane crashes, seat-ejection from planes, parachute opening and exposure to blasts. The project is being undertaken in conjunction with the Naval Medical Research Institute.

The scientists first investigated the mechanical properties of human bones and joints, because the skeleton supports the body and protects vital organs.

Specimens were made from compact-type bones from the extremities of both humans and monkeys. They were put through 17 tests with special gages.

Ultimate strength of bones under compression was found to be about 23,000 pounds per square inch. This gives bone a compressive strength of about one-fourth that of cast iron, or twice that of hickory wood. Compression bone specimens failed with a sudden snap and with longitudinal cracking.

On the basis of their preliminary findings, the scientists concluded:

Bone is an elastic, brittle material.

Next study planned in the research program will include tests of the entire human knee-joint in the standing position.

New developments in high-speed aircraft have caused flight personnel to be subjected to shocks and impacts in regular flying as well as accidents, Bureau scientists pointed out. Basic information for the development of new safety devices is expected to come from the research program.

Science News Letter, August 28, 1948

MEDICINE

New Allergy Remedy

Capable of relieving symptoms in 83 per cent of all allergic conditions, "Trimeton" has brought relief to 81 of 90 hay fever patients treated, report indicates.

➤ A NEW DRUG has relieved 90% of hay fever victims treated with it. Dr. Fred W. Wittich, secretary of the American College of Allergists, announces that this will be reported in the ANNALS OF ALLERGY (Aug.-Sept.), official publication of the College.

The new antihistaminic or antiallergic agent is "Trimeton," manufactured by Schering Corp. of Bloomfield, N. J. Its chemical name is prophenpyridamine. Its advantages and uses are reported by Dr. Ethan Allan Brown and 12 of his colleagues from the Allergy Clinic of the Boston Dispensary Unit of the New England Medical Center.

Trimeton is credited with relieving symptoms in 83% of all allergic conditions. The study involved 227 patients suffering from 20 allergic and non-allergic conditions including hay fever, bronchial asthma, allergic skin reactions, hives, and angioneurotic edema.

Results reported by the group showed that 81 of 90 patients with hay fever were completely relieved; 15 out of 25 patients with bronchial asthma were markedly relieved and five only moderately; 15 of 22 patients with hives had complete release from symptoms and three moderate; every one of three patients with both hives and angioneurotic edema had complete relief.

The drug was given in tablet form in doses of 12.5 to 25 milligrams, one to four times daily. Side reactions from the drug, the most common of which was drowsiness, were severe in only two of the patients treated, the physicians reported.

They are carrying on further studies on the relation of blood pressure to side reactions of antihistaminic agents which will be reported upon later.

Science News Letter, August 28, 1948

ENGINEERING

Oil Cooler for Jets Uses Many Aluminum Tubes

➤ DETAILS of an oil cooler for use on jet planes, which takes the heat from the oil and uses it to pre-heat the fuel, have been revealed by its manufacturer, the Clifford division of the Standard-Thomson Corporation of Waltham, Mass. Also revealed are the hot and cold wind tunnels for testing.

The oil cooler is made of brazed and welded aluminum, saving from 200 to 600 pounds in vital weight in comparison with the copper oil cooler formerly used. There are from 600 to 6,000 aluminum tubes in each cooler. They are six-thousandths of an inch thick. The cooler is now standard equipment for Air Force and Navy planes and is used on many commercial aircraft.

Two wind tunnels are used in the research laboratory of the oil-cooler manufacturer. One, called a hot tunnel, operates normally at 100 degrees Fahrenheit inlet air temperature. The other has capacity to supply to a 24-inch diameter cooler at 60 degrees below zero when rated oil at 225 degrees is flowing through the oil cooler.

Science News Letter, August 28, 1948

ENGINEERING

Size of New Cast Iron Not Altered by Heat

➤ "GROWTH-RESISTANT" cast iron, suitable for use in stoves, furnaces, melting pots and gas or oil burners, was revealed by Battelle Memorial Institute of Columbus, Ohio, where it was developed.

This iron, unlike ordinary iron used for making castings, acquires no permanent extension in size when repeatedly heated in use to high temperatures. The result is it can be employed to make stove tops that will not warp, furnace bowls that remain true and airtight for years, and burner parts that may last indefinitely.

The new iron is a high-silicon product, the silicon being the element which gives it "growth" resistance. It contains also minor amounts of copper and chromium to make it resist scaling at high heat. It maintains satisfactory growth, scaling and impact properties up to 1,700 degrees Fahrenheit. The research resulting in this product was sponsored by the Jackson Iron and Steel Company of Jackson, Ohio.

Science News Letter, August 28, 1948

ICHTHYOLOGY

Rare Fish Species Added To U. S. Museum Collection

➤ FISH MENTIONED in the Bible are included in more than 200 species from the Red Sea being added to the collections of the U. S. National Museum in Washington.

The new specimens were collected during a fisheries survey for the Arabian-American Oil Company by Donald S. Erdman of the Smithsonian Institution.

Another group of weird fish life is being collected for the Museum in the depths of the Atlantic Ocean south of Bermuda by Loren P. Woods, associate curator of fishes. Mr. Woods is in charge of the scientific workers on the *Karyn*, exploration ship of the Woods Hole Oceanographic Laboratory.

These fish will be little-known specimens, adapted to life in darkness under great pressures through millions of years.

Science News Letter, August 28, 1948

ASTRONOMY

Space and Stars Are Same

Finding that stars were formed out of space helps support recent American theories as to their origin, astronomers learn.

➤ TWINKLE, twinkle, great big star,
Astronomers know just what you are.
The self-same stuff is space between,
It's atoms rare and quite unseen.

Or, as the astronomers attending the International Astronomical Union meeting in Zurich would put it:

Interstellar matter has the same composition as normal stars.

Space and the stars that shine are much the same, except that the matter in the stars is close together.

This finding reported by Prof. Bengt Stromgren of the University of Copenhagen Observatory helps support some of the latest American theories as to how the stars were formed in the beginning.

Stars were formed out of space material. That is a part of the theory of Prof. Lyman Spitzer, Jr., of Princeton, that atoms in space stick together to form bits of matter. Prof. Fred Whipple of Harvard carried the idea further, showing how the stars and planets were formed.

A chunk of interstellar space the size of a big room contains about 10,000,000 atoms of hydrogen, 60 atoms of sodium, 100 atoms of calcium, four of potassium, and two of titanium, Prof. Stromgren reported.

Although we do not yet know how abundant helium is, about a million atoms of it may be present. All the other elements are also represented, being about as abundant as in normal stars.

Science News Letter, August 28, 1948

Hot Stars' Lives Brief

➤ IN THE HEAVENS there are spendthrift stars that in their youth are very brilliant and enormously hot. But these stars soon use up their atomic fuel and disappear from sight.

Tau Scorpii, so hot on the surface it reaches a temperature of 20,000 degrees Centigrade, and similar hot stars generate energy at a prodigious rate during their short but fiery lives of less than 3,000,000,000 years. But much of their hydrogen (astronomical atomic fuel) is soon converted into helium.

As they grow old, they contain little hydrogen and disappear from sight, at least as hot, blue (B-type) stars, Prof. Henry Norris Russell, famed astrophysicist of Princeton University, has reported to the meeting in Zurich.

Prof. Russell's communication was delivered by Dr. Otto Struve, of the Yerkes and McDonald Observatories of the Universities of Chicago and Texas, as chairman of the symposium on the chemical composition of the universe. He, like many at the meeting, was surprised to hear from Dr. A. Unsold of the University of Kiel, Germany, that the sun, stars and other bright bodies in the heavens have not changed much since they were created.

Even such hot stars as Tau Scorpii, Dr. Unsold found, have kept pretty much their original composition.

There is little difficulty in seeing why nebulae and the matter between the stars have undergone little change. They lack the mechanism which converts hydrogen into helium by means of the famous "carbon cycle," first proposed by Dr. Hans A. Bethe of Cornell University.

The sun and normal cool stars generate energy at such a slow rate that, during their lifetime, they cannot have converted a large amount of hydrogen into helium. Now astronomers are told that hot stars such as we now see in the sky also have changed little in their lifetime.

Science News Letter, August 28, 1948

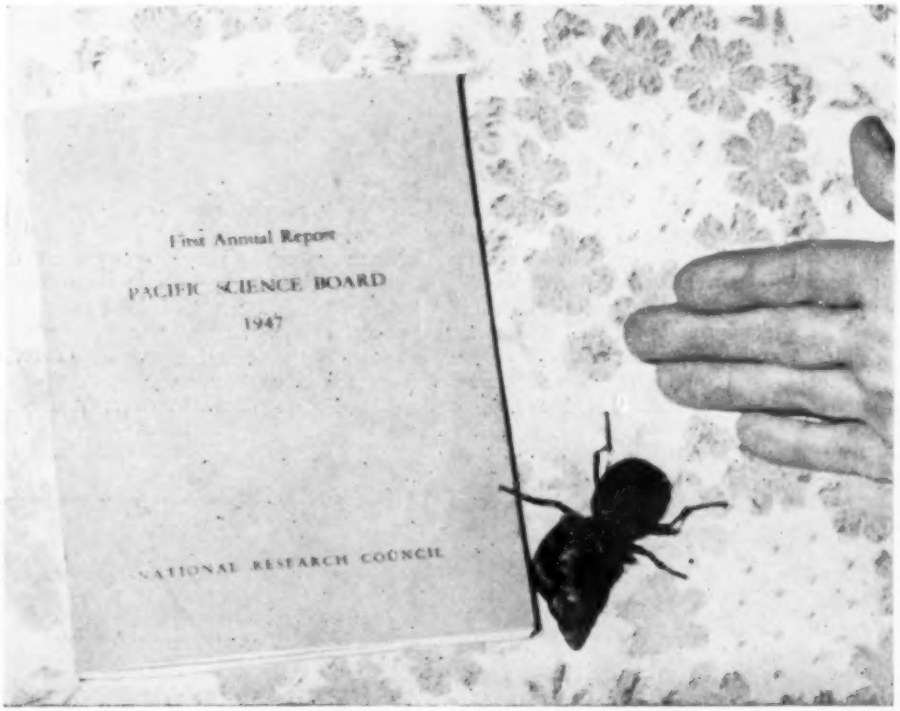
Uranium in Sun and Stars

➤ URANIUM, the atomic bomb element, is undoubtedly present in the sun and stars, but there is no danger or likelihood that it will explode.

The astronomers learned that changes in the heavier elements were completed when the universe was young. While vast atomic energy is manufactured from hydrogen, power from uranium is not possible under the conditions of the sun.

Long before the stars were formed, the universe may have been in a state of temperature and density which favored the nuclear reactions required to produce the abundances of the heavier elements, Prof. O. Klein of Stockholm's Technological Institute said.

Then, as the stars came into being, the abundances of the heavy elements became "frozen." There exist no nuclear processes which can operate under the present properties of stellar material and appreciably change the abundances of the heavy elements. Only the lighter elements continue



BEETLE VS. THE SNAIL—When the long-legged black beetle, Tefflus, attacks the giant African pest-snail, Achatina fulica, bet on the smaller but more powerful beetle. The beetle may become an ally of farmers on Pacific islands whose crops are being devoured by the snail, which when full grown gets to be as much as six inches long. The beetles are now being tested in Hawaii where they were brought from Africa by Dr. F. X. Williams of the Pacific Science Board of the National Research Council. (See SNL, July 17.)

their process of metamorphosis.

Science News Letter, August 28, 1948

Stars Have Much Hydrogen

➤ HYDROGEN is by far the most abundant element in the stars. For every atom of any metal there are about six atoms of carbon, nitrogen and oxygen; 500 atoms of helium; and 5,000 of hydrogen, Dr. A. Unsold of the University of Kiel, Germany, reported at the meeting.

Although we see only the outer layers of a star, we still have a pretty good idea of its total composition. Violent convective currents within the stars keep them constantly stirred up, stated Dr. F. Hoyle of the University of Cambridge, England. Thus the composition of the outer layers, which we observe, is the same as that of the interiors, where the nuclear processes take place.

Science News Letter, August 28, 1948

Letter To The Editor

Allopolyploid Redwood

THAT WAS a good article on my research (SNL, August 21, page 124) except for one thing. I did not call the California Coast redwood a hybrid, but an allopolyploid of hybrid origin. This distinction is more than academic. To the average scientist, whether botanist, zoologist or geneticist, the word "hybrid" refers to an organism like the mule, which is the first generation product of crossing, and is unable to reproduce its own kind, or if it can do so, fails to breed true. On the other hand, the process of doubling the chromosome number converts the hybrid into a full-fledged species which is not only fertile, but faithfully reproduces its own kind without undergoing Mendelian or any other kind of genetic segregation. Such allopolyploids are well known as established species in the plant kingdom. Cultivated wheat, cotton, and tobacco are all allopolyploids species which, in my opinion, have originated in the same way as the Coast redwood. However, they have been reproducing their own kind for thousands of years and, of course, cannot be compared to true hybrids like the mule. I don't know what terminology or explanation would put over this point best to the general public, but it seems to me an important one.—G. Ledyard Stebbins, Jr., Professor of Genetics, University of California.

Science News Letter, August 28, 1948

ENGINEERING

Harness Water Power

➤ PUERTO RICO'S great economic problem, too many people and too few jobs, is promised solution through hydro-electric power. With power available, factories will follow, and jobs will be plentiful. A big start toward the solution is well under way.

This American island, about one-half the size of New Jersey but relatively mountainous, has a population of 2,100,000, or over 540 persons per square mile. The amount of available farm land is far too little to support its people at any reasonable living standard by agriculture alone. Therefore industries are needed. Without domestic coal or oil, the water in its mountain streams is the logical source of power. It is already being harnessed.

The Puerto Rico Resources Authority, instituted by the Insular government in 1941, is behind the plans for water development. This agency has the job of the unification of water use for all purposes, including power, irrigation and domestic needs.

Its biggest dam is now near completion. This is a part of the so-called Caonillas project. The Garzas and Dos Bocas projects are already in operation. Fifteen smaller dams are also in use. These 18 together will give the island all the power it needs for the present, some 400,000,000 kilowatt hours per year.

As factories are established to use this power, other projects will be started. The island can produce about twice this amount of electrical energy. It will all be in use by 1970, it is expected.

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MEDICINE

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NUTRITION-PSYCHIATRY

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PUBLIC HEALTH

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VETERINARY MEDICINE

How much unfit meat reached the public in 1947? p. 133

What three-way threat to food supplies would be created by an atomic attack? p. 134

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SCIENCE NEWS LETTER

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CAONILLAS DAM—This $10,000,000 hydro-electric and irrigation project is the largest in Puerto Rico. It is nearing completion between the cities of San Juan and Ponce.

The Caonillas hydro-electric project is midway between San Juan and Ponce, the two principal cities of the island. Together with Garzas and Dos Bocas, it is located in the mountainous central western area of Puerto Rico where the annual rainfall reaches some 200 inches.

The Caonillas dam will stand 230 feet above stream level. Its reservoir will hold 50,000 acre feet of water. A two-mile tunnel will connect this reservoir with Dos Bocas lake. A five-mile tunnel will later divert water from the headwaters of the Arecibo river into both lakes. Year-around water is thus assured.

Science News Letter, August 28, 1948

VETERINARY MEDICINE

U. S. Eating Unfit Meat

In 1947, 40,000,000 pounds of unfit meat reached the public. Veterinarians also told that human cases of brucellosis are increasing.

➤ "UNSUSPECTING" Americans are eating millions of pounds of unfit meat each year, the American Veterinary Medical Association's convention in San Francisco was warned.

More than 40,000,000 pounds of unfit meat went to public markets last year, the Association's committee on food and hygiene estimated. A report blamed the situation on failure of cities and states to provide complete and adequate veterinary inspection.

About 69% of the meat processed in the U. S. last year came from packing plants under federal veterinary inspection, while the rest was under municipal or state supervision, it was explained.

The report emphasized that complete inspection includes examination of the animal before slaughter as well as after. "Only a few states" have such a program, the committee charged.

Only about one half of the clean poultry sold received veterinary inspection, the report said. Nearly one-twelfth of the poultry inspected was rejected for human consumption.

The report said that 20%—one out of every five quarts—of milk consumed in the nation last year was not pasteurized.

Disease testing and universal pasteurization were stressed in a program recommended for public health.

Science News Letter, August 28, 1948

Brucellosis in Humans

➤ HUMAN CASES of brucellosis, a disease acquired from infected animals, have increased 60-fold in the past two decades, Dr. James H. Steele, Atlanta, Ga., chief veterinarian of the U. S. Public Health Service, reported.

Dr. Steele said that the disease which comes mainly from swine and cattle now ranks with encephalomyelitis (sleeping sickness) and rabies as the most serious threat to public health from animals.

Science News Letter, August 28, 1948

Chicks Get Arthritis

➤ A STRANGE new virus disease which produces arthritis in chickens before they are hatched is a new threat to the nation's food supply.

The disease which strikes turkeys as well as chickens was described to the meeting by the Association's poultry committee. The new disease of embryo chicks has been reported only in the eastern states thus far, the committee said, but it may be more prevalent than is realized.

It causes both respiratory and nervous disorders in poultry. In turkeys, the nervous disturbances are like those from the better-known poultry menace, Newcastle disease. The latter has now spread to all but three states, the committee commented.

Science News Letter, August 28, 1948

Over-Eating in Lambs

➤ A NEW immunizing product and sulfur in feed are two new methods of keeping lambs from literally eating themselves to death.

Drs. A. W. Deem, Rue Jensen and Floyd Cross, all of Fort Collins, Colo., explained that over-eating of grains and other concentrates produces an intestinal poisoning in lambs. Sulfur in the diet or use of a new bacterin were both found effective in preventing loss of lambs from too much food.

Science News Letter, August 28, 1948

Crowding Endangers Calves

➤ ADD to the victims of a housing shortage many calves that are killed by infectious disease, Dr. W. J. Gibbons of the Alabama Polytechnic Institute advised the convention.

Dr. Gibbons explained that too many calves are killed by infectious diseases which they get from older cattle in crowded barns. He urged keeping calves in small, isolated groups of approximately the same age as a means of adding to the nation's meat supply.

Science News Letter, August 28, 1948

Drugs Cause Cattle Loss

➤ PROPAGANDA urging farmers to use penicillin, sulfa drugs and other products

on their livestock may be causing some losses of animals, the convention was told.

When these drugs are used without skilled diagnosis, proper dosage or adequate care, the farmer may not only lose the money spent on the drugs but his animals, the public relations committee of the Association charged.

"Certain groups and commercial interests who are seeking to exploit the farmer for private gain" were attacked for promoting the sale of these drugs without proper precautions.

Science News Letter, August 28, 1948

VETERINARY MEDICINE

Three-Way Peril to Food

➤ A THREE-WAY THREAT to food supplies in event of an attack with atomic weapons was described by Army scientists to the national convention of the American Veterinary Medical Association in San Francisco.

In atomic warfare, food supplies of human survivors would be endangered by:

Loss of livestock and food in the burst area.

"Atomic sickness" of food animals.

Atomic contamination of food supplies.

Fighting these food dangers would be the job of veterinarians, the convention was told by Col. W. O. Kester of the Veterinary Division of the Office of the Army Surgeon General and Maj. E. B. Miller of the Army Medical Library.

Blast injury or damage, burning or scorching and biologic effects on animal tissues and other materials result from an atomic explosion, they reported.

Animal survivors of the Bikini atomic bomb tests showed many of the same symptoms and ills as the Japanese survivors of Hiroshima and Nagasaki. Some of the goats, pigs and rats appeared healthy for several days, although their white blood cell count went down. Within two weeks, some of them died after showing several types of symptoms. Almost no deaths of Bikini animals occurred after the first month, the scientists said.

Science News Letter, August 28, 1948

Testimonials Attacked

➤ TESTIMONIALS by veterinarians of claims made for drugs and foods for animals were labelled "vicious" by Dr. S. W. Haigler of the Association's committee on ethics. He attacked testimonials as a violation of professional ethics and urged state groups and schools of veterinary medicine to encourage progress in adopting a uniform code for veterinarians.

Science News Letter, August 28, 1948

Viruses in Chicken Coop

➤ AIR "RAIDS" in chicken coops are causing losses to valuable supplies of poultry, the veterinarians were warned.

Dr. K. B. DeOme of the University of California described the air attack. It is made by viruses of two poultry diseases. Dr. DeOme reported experiments proving that the diseases are spread by air-borne transmission. Chickens inhaling air or dust containing the viruses were infected with the diseases.

Ultraviolet lamps and certain chemical vapors were found very effective against the virus of the disease, laryngotracheitis, he explained. But against the virus of the dread Newcastle disease of chickens, these anti-air-virus weapons were much less effective, it was discovered.

Science News Letter, August 28, 1948

OPTICS

Dark Glasses Worn by Night Drivers Are Unsafe

➤ DARK GLASSES, worn at night by automobile drivers to relieve the glare from on-coming headlights, are often a hazard, the National Bureau of Standards finds in a recent investigation of protective glasses and goggles. They decrease visibility.

Most types of combinations of shaded glasses have been found to be unsafe as a means of protection against glare from automobile headlights, Ralph Stair of the Bureau staff states. In general it is the belief that any advantage of reducing glare from car headlights by wearing dark glasses is more than counterbalanced by the extra hazard arising from the decreased visibility of objects.

Tests by a number of observers indicate, however, some basis for claims of increased visibility and reduction of glare through the use of yellow glass. Dark glasses are an active aid in glaring sunlight. They cut the brightness to a comfortable value such that the protective mechanism of the eye can assume control of the radiant energy reaching the retina.

Eyeglasses are essential for workers in many types of occupations, the Bureau emphasizes. But they must be adapted to the particular job. In operations such as welding with coated rods, or in aluminum or magnesium welding and cutting, producing high radiant flex at the wavelengths of sodium lines, glasses containing didymium have been found useful. Glassblowers also need didymium glasses because ordinary glass, with its high sodium content, gives off an intense yellow flare when heated.

Special cobalt-blue glasses have been used and demanded by operators of open-hearth furnaces, in the particular shade with which the operator is familiar, because of the contrast in brightness between the molten metal and the interior of the furnace. Blue-amber glasses are worn by operators in the Bessemer steel-producing process because with them they can note certain color changes of the flame as the impurities are burned off.

When glasses having a high optical density are worn for protection of the eyes in industrial operations, the elimination of harmful ultraviolet rays must be given first attention. Infra-red rays, which are heat waves, can be given second consideration because a worker is generally forewarned by a burning sensation.

Science News Letter, August 28, 1948

AGRICULTURE

Farmer Who Trapped Skunks Lost His Ducks to Turtles

➤ A FARMER complained that he lost his ducks when he began trapping skunks. He was the victim of a sort of biological "chain reaction."

The mystery of the missing ducks is told by Dr. Edward H. Graham, chief of the biology division of the Soil Conservation Services of the U. S. Department of Agriculture.

The key to the farmer's skunk-duck troubles turned out to be turtles. It worked this way:

The farmer trapped the skunks. The skunks had been eating the eggs of snapping turtles. The turtles multiplied as the skunks were caught. Then the turtles began to feed on the ducklings.

The moral, says Dr. Graham, is: Think in terms of interrelationships rather than simple cause and effect in dealing with nature.

Science News Letter, August 28, 1948

INVENTION

Buzzer Warns Fisherman When Fish Is Hooked

➤ AN ELECTRICAL GADGET that can be a good friend both to the very lazy fisherman and the very busy one has been invented by Antoni Linder of Chicago, and is covered by U. S. patent 2,446,427.

It is built essentially like a door or desk buzzer, only instead of having a button to push it has a hook to pull. The fisherman's line is made fast to this hook, and when a fish bites, the tug transmitted through the line closes the contact and sounds the buzzer.

The lazy, vacationing fisherman, with one line out, can lean back and snooze, or sit up and play bridge or engage in whatever other activity may be going on aboard, until the buzzer sounds. On the other hand, the busy commercial fisherman, who may have a dozen or more lines out at once, will be notified by the buzzer whenever a fish is waiting to be hauled in.

Science News Letter, August 28, 1948

NUTRITION-PSYCHIATRY

Poor Diet Affects Mind

Lack of vitamin B complex in diet produces mental abnormality within two years if the deficency is not drastic, tests with patients show.

➤ LIVING ON A DIET which does not contain enough of the vitamin B complex ordinarily obtained from meat or whole grains causes mental abnormality. This was found in an experiment with a small group of men patients at the State Hospital in Elgin, Ill.

The changes come slowly and insidiously, if the dietary deficiency is not drastic. Decline in mental ability may not be noticed until after about 18 months of poor diet and then no one can be certain of a definite date when the symptoms started.

Men who had been moving about actively, helping in the ward work or talking to one another, lost interest and ambition, became dull, sat in their chairs or lay on their beds. They were disinterested in their surroundings.

These symptoms occurred in one group of 12 men patients whose diet contained plenty of all the essential nutritional elements except that the vitamin B content was reduced from a normal 1,200-2,000 micrograms to 400 micrograms, or about a third of normal. (A microgram is a unit of weight equal to 35 billionths of an ounce.) The riboflavin was cut from a normal of 1,600 to 2,600 to 800 micrograms, or about half.

Much more dramatic results occurred with another group for which the riboflavin intake was cut to 800 daily and the thiamin to 200 micrograms.

After only four to six months on this more severely restricted diet, mental abnormalities became much worse. One old man who had been quite amiable, became infuriated and threatened to break up the furniture and escape. A young man who had been subject to bad temper fits which ordinarily lasted a minute or so, once or twice a year, went into blind rages.

These occurred in quick succession and lasted a half hour to an hour. During this time, he would scream at the top of his lungs, throw heavy objects at anyone within reach and curse at the women attendants.

Just as dramatic as the onset of these symptoms was the recovery when the inadequate diet was supplemented with yeast extract to provide the missing vitamin B.

The rage of the terrible-tempered old man subsided overnight and he became his former amiable self again. The young man who had endangered the lives of all around him, appeared self-controlled the day after he was given the vitamin B. Only one old man took several weeks to regain his former contentedness.

Patients on the less severely restricted diet whose mental abnormalities had been very slow and gradual in development were also comparatively slow in recovery.

Persons who have a low energy output can get along for a longer period on a diet lacking somewhat in vitamin B, the investigators conclude. They found that the regressed patients with schizophrenia, who ordinarily have interests and ambitions dulled and are relatively inactive showed the changes later than did the patients with cerebral arteriosclerosis and other mental illnesses not associated with general decrease of energy output.

Because of the slow and insidious way that mental symptoms appear, it is not possible, the investigators feel, to be sure that a diet is not dangerously deficient in vitamin B, if study of it is not continued for at least two years. Details of the study are reported in the AMERICAN JOURNAL OF PSYCHIATRY (August).

Science News Letter, August 28, 1948

BACTERIOLOGY

New Laboratory Set Up To Study Shellfish Bacteria

➤ A NEW ATTACK on the bacteria which can infect oysters, clams and mussels and in turn infect the people who eat shellfish will be made in a new laboratory of the U. S. Public Health Service at the Woods Hole Oceanographic Institution.

Scientists at the laboratory will study shellfish bacteria and determine any changes needed in present shellfish-raising regulations. Oysters, soft clams, hard clams, and mussels will be included in experiments.

James L. Dallas, who is on leave from the Massachusetts Department of Health, will head the new laboratory.

Science News Letter, August 28, 1948

BOTANY

More Vanilla Expected From New Experiments

➤ VANILLA will presently become more abundant, and possibly more fragrantly flavored, as a result of experiments conducted at Cornell University by Prof. Lewis Knudson. He has succeeded, through the use of a special nutrient medium, in germinating the seeds of the vanilla vine, once considered an impossible botanical feat.

Two hundred hybrid vanilla seedlings have now been shipped to the U. S. Agricultural Experiment Station in Puerto Rico, where they will be tested for resistance to root disease and for quality and quantity of yield.

The best vines will be propagated by cuttings. If vanilla grows well in Puerto Rico, the island's contribution to this country's $10,000,000 annual demand for the flavoring beans will do something towards relieving its chronic rural unemployment.

Science News Letter, August 28, 1948

INVENTION

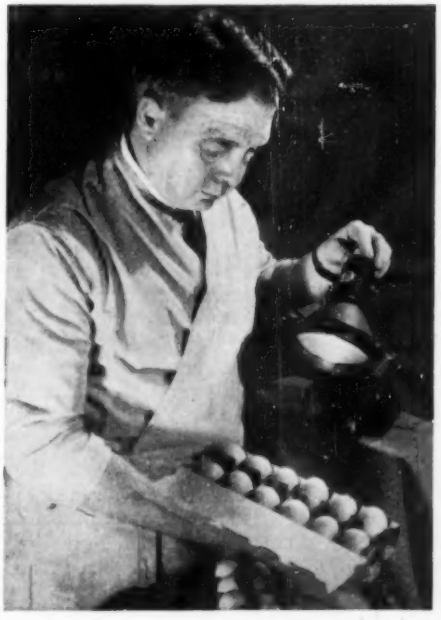
Age of Eggs Revealed by Color Under Ultraviolet

➤ OLD EGGS can be separated from fresh ones by their color under ultraviolet light. This was revealed by Willett R. Wilson, a Westinghouse lamp engineer who has been experimenting with the effects of this invisible "black light" for years.

In the ultraviolet light an old egg shows up purple while a really fresh egg glows scarlet. The outer shell of a hen's egg and its protein covering are fluorescent, he explained. Probably the color switch occurs when oxidation causes a chemical change in the shell.

Ordinarily, unrefrigerated eggs kept under average temperature and humidity turn gradually from a scarlet fluorescence to purple in eight to ten days. Properly refrigerated eggs retain their freshness and scarlet fluorescence longer. Brown eggs and white eggs both show scarlet under black light if they are fresh.

Science News Letter, August 28, 1948



FRESH OR OLD EGGS?—Invisible ultraviolet rays differentiate old from fresh eggs by their color under a black light projection unit. Fresh eggs glow scarlet and old eggs purple, new Westinghouse tests show.

ELECTRONICS-CHEMISTRY

Electro-Chemical Research To Boost India's Progress

➤ A NOTABLE STEP in India's progress in science and the application of science to economic advancement was the recent corner-stone laying in Karaikudi of an electrochemical research institution. Its work will be along the lines followed by similar institutes in America and elsewhere.

The first building of the institute, a laboratory, will be ready for use in about a year. Other construction will require another year or two. The investigations to be made will cover problems in electrolytic and electro-thermy fields. They will include the production of heavy water, other inorganic and organic chemicals by electrochemical methods, electrode position, electro-metallurgy, primary and secondary cells and electric furnaces.

Adjacent to this research institute, which will be on a 300-acre tract of land presented by a private citizen, will be an engineering college, a research institute in higher mathematics, and a technological and polytechnic institute. Together they will become an important center to bolster India's industrial activities and promote the use of Indian raw materials.

While the per capita consumption of electricity in India is low compared to the United States and Britain, it is expected that before long it will increase very much, thanks to the setting up of vast hydro-electrical power projects all over the country. This, coupled with the availability of key raw materials and labor resources, will probably lead to a rapid growth of the electro-chemical industries.

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ZOOLOGY

Where Gerbils Stop and Baboons Begin Is Found

➤ WHERE the gerbils stop and the baboons begin has been discovered by the University of California African Expedition.

It is where desert animals, such as the gerbil, a mouse which stores fat in its tail, begin to disappear and animals of the African Sudan are seen.

Dr. Ernst Schwarz, zoologist with the U. S. Navy medical group, headed a group which traveled down the east bank of the Nile, from the southern border of Egypt through Anglo-Egyptian Sudan to the border of Uganda.

At the Atbara river, in northern Sudan, the dividing line seemed to be found. Baboons and antelopes were seen instead of gerbils, the Dorcas gazelle and the Mediterranean fox.

Another zoological dividing line was found in the Sudan, at the Sobat river, where Uganda animals were first found. But this division was less clear cut, because of an ancient forest which was once there. In the mountains of the region are found strange monkeys, including the blue monkey, the black mangabey and blue duiker.

Investigation by Dr. Schwarz has disproved previous reports that the Norway rat, common pest in both Europe and America, was found in this part of Africa. He found the black rat, or plague rat, which is less common in the U. S. and Europe, but no Norway rats.

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PUBLIC HEALTH

People Live Longer in West North Central States

➤ PEOPLE LIVE LONGER in Nebraska than in any other state. Healthiest section of the nation, from the standpoint of length of life, is the West North Central states: Minnesota, the Dakotas, Nebraska, Iowa, Kansas and Missouri.

These facts were disclosed in new tables for white population worked out by the Statistical Bureau of the Metropolitan Life Insurance Company under the auspices of the National Office of Vital Statistics of the U. S. Public Health Service.

Women in the West North Central states live to be more than 69 years old, while men average over 65.

Shortest length of life is in the Mountain states: Idaho, Montana, Wyoming, Colorado, Utah, Nevada, Arizona and New Mexico. Men average 60.98 years and women, 66.03 in that region. High death rates for the Spanish-speaking populations of Arizona and New Mexico helped lower the average, it was pointed out.

Shortest average length of life for men is in Arizona, while women have the shortest life span in New Mexico.

Lowest death rates for a person between 25 and 45 years old are in New England. But at 45, the average New Englander has a life expectancy of only 25.37 years, compared with 27.56 years for the West North Central states.

Dividing the country into three sections, the statisticians found that the North has the longest average length of life, followed by the South and the West.

Men in the North have an average life expectancy of 63.43 years at birth; women, 67.51 years. Men live to be slightly older in the South than in the West, but women live longer in the West.

The newly-published figures for regional life expectancy were compiled for the years 1939-41.

Reasons for the differences in length of life in different regions include several factors, it was pointed out. General standard of living, degree of industrialization, density of population, adequacy and availability of medical and hospital facilities and climate are mentioned as some of the possible reasons for the differences found in the new tables.

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IN SCIEN

PUBLIC HEALTH

Doctors Increase Faster Than U. S. Population

➤ THERE ARE 17% more doctors today than there were in 1940 while the population of the United States has increased only 12% in the same length of time.

Dr. Frank G. Dickinson, director of the American Medical Association's Bureau of Medical Economic Research, estimates on the basis of punch card tabulation that on June 1 there were 199,755 living physicians in this country. In 1940 the A. M. A. Directory listed only 170,163.

Some of these doctors are retired, some are not in practice and some are employed by federal, state and local health agencies, Dr. Dickinson points out.

Five states with more than 10,000 doctors are New York, 30,970; California, 16,069; Pennsylvania, 14,633; Illinois, 13,307; and Ohio, 10,091. Dr. Dickinson cautions that these figures are tentative, owing to unrecorded deaths, interstate migrations, and to other factors.

Five states with fewer than 500 doctors are: Nevada, with 198; Wyoming, 252; Delaware, 439; North Dakota, 467; and Idaho, 470.

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PHYSICS

Tiny Crystals Put in Thin Casts for Study

➤ CRYSTALS which are invisible in any existing microscope are now being put in casts a millionth of an inch thick so that their structure can be seen.

The tiny crystals are so small that they can not be seen with an ordinary microscope, and they will not let streams of electrons through them for study with an electron microscope.

C. J. Calbick of the Bell Telephone Laboratories, Murray Hill, N. J., reported at the International Congress of Crystallography held at Harvard University that models of the crystals which can be studied with an electron microscope have been made.

Each crystal is coated with a thin film of silica, the main ingredient of sand. Then the crystal is dissolved in acid, leaving the thin silica wall as a replica of its surface. This shell is transparent to electrons.

Two different views of the crystal shell, seen through the electron microscope, give a three-dimensional picture of the crystal. The same principle is used to give depth to pictures seen through a parlor stereoscope.

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E FIELDS

ENTOMOLOGY

Flies That Survive DDT Discovered in New York

➤ NEW EVIDENCE that some house flies are getting too tough for DDT was reported at the annual open house of the New Jersey Agricultural Experiment Station, New Brunswick, N. J.

Drs. John B. Schmitt and George W. Barber, both of Rutgers University, said that DDT-resistant flies had been tested in the laboratory after they were captured in a New York resort hotel.

An exterminator discovered the flies when three sprayings with DDT failed to kill them, where one spraying had formerly done the job. The scientists checked the exterminator's methods and then reared three generations of the flies which were resistant to DDT.

Other insecticides, including Chlordane, were found to kill the flies which survived DDT. Detailed results of the experiments will be published soon.

U. S. Department of Agriculture scientists have reported raising DDT-resistant flies in the laboratory through more than 30 generations.

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PSYCHOLOGY

Personality Is Guide To Choice of Friends

➤ "CAN tell good jokes."

"Doesn't hurt people's feelings."

"Saves me a seat so I won't have to sit with the girls at lunch."

These are typical of the reasons boys and girls have for picking their best friends, as found by Drs. Mary C. Austin and George G. Thompson of Syracuse University. The psychologists questioned 404 sixth grade pupils in seven elementary schools.

It is personality that is important among friends in this younger set—more important than mutual tastes or interests. And when friends are dropped from the list—as some were after two weeks—it is the ex-friends' behavior that is to blame.

Cheerfulness, kindness, honesty and generosity are the most important qualities to children when it comes to picking friends. They revealed this in what they put down when they made a list for the psychologists showing their three best friends and their reasons for choosing them and in the list they made two weeks later showing how their opinions had changed.

"She has not been wanting to be friends —he thinks he is 'hot'—he stole my girl friend away—she is always treating me mean," they charged when they dropped a friend.

Sixth graders tend to be fickle. Approximately 60% of them made some changes in their list of best friends within two weeks.

Children naturally made more friends with others who lived nearby, but nearness alone was not enough. "Out of sight, out of mind" seemed to be generally true since lack of recent contact accounted for 14.5% of the broken friendships.

The psychologists concluded from this that parents could help their children's social progress by providing play rooms and shops which would attract other children, since it is very important to popularity-rating for a child to keep in contact with others.

They also noted that broad interests and tastes are important to children's happiness. Parents who try to restrict their children's interests are hindering their social development.

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NUTRITION

Canned Fish Spreads Are Being Developed

➤ YOU MAY be adding fish spreads to the menu soon if the experiments of Norman D. Jarvis, food technologist for the Fish and Wildlife Service, are successful.

Finished formula for the spread has not yet been perfected, but Mr. Jarvis hopes to have it ready by the end of the year.

The fish spreads contain tomato, dried skim milk, margarine, flour and a small amount of seasoning as well as fish. The tomato is for color, flour acts as a binder and milk adds food value.

Mr. Jarvis has tried more than 40 species of fish. Best ones for making fish spreads are chum salmon, mackerel, pollock, lake herring, and rosefish.

Fish spreads on the market now are imported from Europe and made for a limited, high-priced market. Mr. Jarvis' canned fish spreads are inexpensive and planned for possible use in the Federal-aided school lunch programs.

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MEDICINE

Five-Year Grants to Aid Young Medical Scientists

➤ FUNDS for helping relieve the shortage of teachers in medical schools and for encouraging research in medicine are being granted to young medical scientists by the John and Mary R. Markle Foundation in New York.

The grants are made for five years at a rate of $5,000 a year to young scientists who have completed their training. Now being awarded are grants for the school year 1949-50. Men and women receiving these grants will be appointed as full-time teachers on the staffs of medical schools. Schools will nominate candidates.

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ARCHAEOLOGY

Outlines of Mysterious "Lost Colony" Fort Found

➤ THE OUTLINES of the fort which was built and then mysteriously deserted by Sir Walter Raleigh's "lost colonists" at Roanoke Island, N. C., have been located in recent archaeological surveys made by J. C. Harrington of the National Park Service.

The Roanoke colony, which represented the first English attempt to colonize within the continental United States, was first settled in 1587. Then Governor John White left his colony and returned to England. When he returned in 1591 he found no trace of the settlers but the strange word "Croatan" carved on a tree.

The fort has an unusual outline, with bastions on the sides of the basic square rather than on the corners. Two pointed bastions commanded the approach to the water. There is a rounded bastion on the south side which may have enclosed a building and an entrance facing west, probably toward the settlement.

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PSYCHOLOGY

Fear Is Produced in Laboratory Experiments

➤ FEAR has been produced in the laboratory for experiments by putting a man in a chair and suddenly letting the chair drop backwards at a 60-degree angle. This was done so that what happened to the subject psychologically could be measured.

This scientific use of the chair "gag" was described by Dr. Martin L. Reymert, director of the Mooseheart Laboratory for Child Research, as a guest of Watson Davis, director of Science Service, on Adventures in Science over the Columbia network.

These experiments disproved a theory held by earlier psychologists that the emotion of fear is a result of the way the body changes when faced by a frightening experience. According to the old theory, first we see a bear, then we begin to run and then we feel fear.

Pounding heart, rapid breath and other body changes, just like those which result from fear, can be produced by running upstairs or sawing wood. But in this case there is no real feeling of fear, experiments show.

There are many emotions—love, hate, sorrow, anxiety, shame—but no unique pattern of body changes to distinguish each, Dr. Reymert pointed out.

According to a more recent view, emotions are governed by a particular section of the brain known as the thalamus.

This idea fits the facts better than did the earlier theory but there is a great deal of work still to be done before emotions are really understood, Dr. Reymert said.

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ARCHAEOLOGY

Uncovering Africa's Past

Starting with the Sinai peninsula, the University of California African Expedition has penetrated into the continent proper making many startling discoveries.

By Dr. FRANK THONE

See Front Cover

➤ AFRICA has for centuries exerted on men's minds the fascination of unsolved mystery. It was so to the Greco-Roman world of antiquity, to which Ethiopia meant Farthest South; it was still so to our own grandparents of the mid-nineteenth century, who thrilled to the unknown when they uttered their favorite geographical cliche, "Darkest Africa."

Much of the darkness has been dispelled from over the great continent. You can go to the railway station in Cairo and buy a through ticket to Capetown, airplanes droning over the Congo are so commonplace that natives no longer bother to look up at them, and the descendants of Herodotus' "anthropophagi" (cannibals, to you) conduct decorous classes in Sunday school.

But the mystery of Africa has only been breached, not dissipated. Partial answering of some questions has only sharpened the need for finding fuller answers. Many of the most brilliant discoveries of the past two or three generations of exploration have only opened up windows on new and challenging vistas of the unknown.

Delving into Antiquity

Acquaintance with Africa's many and highly varied peoples, for example, has raised questions of where they came from, how they got there, and what can be done to make their future pleasanter and more profitable for them than their immediate past. Chance scattered discoveries of fossils representing remoter antiquity of man and his relatives, like the famous Rhodesian Man skull, and more recently the puzzling bones of manlike apes in South Africa, have broadened and intensified the challenge to dig up more parts of the puzzle and piece them together into a completer picture.

Most ambitious and far-reaching acceptance of that challenge thus far is provided by the University of California African Expedition, which has undertaken a sweep over the entire continent from north to south, finding out everything possible about present peoples and about the still-unfathomed past. It has already been in the field for many months, with a staff of a score or more trained graduate workers. Its leader is Wendell Phillips, with energetic young William B. Terry as field executive. Africa's own scientists, from Egypt to the Union of South Africa, have participated in the program. Results are beginning to roll in, some of them along expected lines, others quite unlooked-for and dramatic.

One of the first regions to be examined was not properly in Africa itself, but rather upon the threshold between Africa and Asia. This is the Sinai peninsula, where the Children of Israel wandered on their way from Egypt to the Promised Land, and where Moses received the tables of the Law.

Wanderers Before Moses

There were wanderers there long before Moses, abundant evidence showed. At Rawafi was found a site of early Old Stone Age, with several hundred almost perfect stone hand-axes right on the surface. These were of the primitive type used by Neandertal Man. Farther to the southwest in Sinai, two more Old Stone Age sites were discovered, with implements of the same type. The presence of such large numbers of stone tools at Rawafi suggests that this was no mere campsite or temporary settlement, but a center of Stone Age industry—a kind of paleolithic Pittsburgh. These sites on Sinai are also of importance as markers on Neandertal Man's migration from his presumed original home in Asia into Africa.

Thirteen skulls, taken from tombs in the Sinai region, are shown on the cover of this week's SCIENCE NEWS LETTER. Mrs. Gladys Terry, wife of the Expedition's field executive, is shown in the background.

Search for traces of the remote past in Egypt centered in the Faiyum, a wide lowland west of the Nile valley, that was once the bed of a vast lake. This was far back in Ice Age times, when the climate of northern Africa was rainy and the land was rich with vegetation where it now is desert. Terraces on the sides of the dry hills mark the levels of the lake as it gradually shrank, as similar terraces in Utah and Nevada mark the stages of the vast Ice Age ancestor of the present much-shrunken Great Salt Lake.

During Egypt's great days, the Faiyum was a rich province ruled by governors of the Pharaohs, and there were elaborate irrigation works and canals. An airplane was used in scouting for the remains of these canals, now choked with desert sand. Some were found as recent as the reign of Cleopatra, Egypt's last independent monarch. Others proved to be older than any recorded dynasty on the Nile.

These earliest canals were the work of farmers of the New Stone Age, or Neolithic, when agriculture was still something new under the sun. Particularly active in finding village sites and other remains of these Egyptians who were before any Pharaoh was Dr. S. A. Huzayyin, modern Egypt's leading prehistorian.

Still older than these remains, older than any human occupation, were bones that gave evidence that what was a great lake in early human times was an arm of the sea before that. Most convincing of these bones are the remains of a primitive kind of whale known as Zeuglodon; two practically complete forty-foot skeletons of these great sea-beasts were found "chasing each other" in what the workers promptly christened Zeuglodon Valley. Other remains of aquatic animals included bones of crocodiles, turtles and hippopotamuses, belonging to the later, fresh-water phase of the region.

Then the expedition shifted base farther south, into the Sudan. Here the main concern was with the present-day population and its health troubles—which are many. Diseases that are rarities, hardly more than names, to doctors in the temperate zones are everyday commonplaces in the clinics of the Sudan. The medical personnel of the expedition were joined by four U. S. Navy men—a doctor, two parasitologists and a photographer—and together they saw their fill of such outlandish and distressing ailments as elephantiasis, schistosomiasis, loa-loa, bilharzia and sleeping sickness.

Elephant Shrew

Here also the medical men struck a jackpot, in the shape of an addition to the scanty list of animals susceptible to malaria and hence of value in research on that scourge of the human race. This is the elephant shrew, a long-tailed, flexible-nosed little animal that looks like an oversized mouse but isn't a rodent at all. A collection of 104 of these animals was flown directly from the Sudan to Washington, where they are housed at the National Zoological Park, with medical research men from the Naval Research Center busily at work on them. (*See SNL*, June 12).

At all the expedition's stops, its physical anthropologist, Dr. Henry Field of Washington, D. C., took detailed head and body measurements of the natives. He got data on 225 Beduins in the Sinai peninsula, 190 inhabitants of the village of Tamiya in the Faiyum, 120 "Fuzzy-Wuzzies" in the Sudan, and 150 Masai in Kenya.

The expedition is now in Kenya, where the remote, pre-human past has again come in for attention. Ape teeth of Miocene age (perhaps 40,000,000 years) have been found in the Lake Rudolf area by a South

HEAD MEASUREMENT—A Beduin is shown patiently submitting to measurement of his head by Dr. Henry Field for comparison with skulls found in tombs.

African paleontologist, Dr. Basil Cooke, and by Dr. Robert Denison of Dartmouth College.

In the meantime, measurements of the living human inhabitants are being made by an Egyptian anthropologist, Dr. Mohammed Mitwally of Farouk University in Alexandria. A colleague of his, Dr. Mohammad Awad, is studying the fossils of invertebrate animals near Mombasa.

A special job is being done on the Masai people of the region by a leading Hollywood technologist, Arch Obeler, who is making sound recordings of their ceremonies, and films for television broadcasts. A unique feature is the recording of the Masai blood-letting ceremony, a ritual which strangers have hitherto rarely been permitted to witness.

Plans for the future of the expedition include more tropical medical research, in the Congo, British East Africa, French Equatorial Africa and Portuguese East Africa or Mozambique. A cave at Ladysmith, in the Union of South Africa, is to be excavated, and with luck should yield still further information on ancient human and sub-human life on the no-longer "Dark Continent."

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PSYCHOLOGY

Recall Painful Memories

➤ WHAT ARE your most unpleasant memories of your childhood? Did you break an arm? Or get sent to bed as punishment? Or cheat on a spelling test?

These are some of the things which 150 college girls recalled as their most unpleasant memories when they were tested by Dr. George G. Thompson and Sam L. Witryol of the Syracuse University School of Education.

The investigators found that painful injuries were the most frequently remembered unpleasant experience of the first five years of life. From 6 to 12 years, being forced to do unpleasant things headed the list, and from 12 to 18 years, deaths of friends or relatives were recalled most often.

Injuries ranged from "cutting finger with razor" to broken bones. Some of the unpleasant things which the girls recalled being forced to do included:

"Had to practice on cornet."

"Having to kiss relatives."

"Being sent to principal's office for punishment."

From the earliest years, the unpleasant memories other than injuries included such things as sensory irritations ("taking castor oil"), illness, loss of personal property, corporal punishment and being attacked by animals.

But from 6 to 12, being "yelled at," teasing, fears, fighting, trips to doctors and sense of guilt became more important.

One girl recalled her sense of guilt, "Hit

Do You Know?

In Greece, *sheep* are raised primarily for milk.

Male *tigers* sometimes weigh 600 pounds; females seldom exceed 300 pounds.

Scientific research has been called the fourth dimension of industry.

Good sources of *vitamin A* include liver, sweet potatoes, carrots, spinach, greens, apricots, tomatoes and peas.

Pre-emergence weeding is a new phrase in gardening; it is the growing practice of applying weed-killing chemicals to planted fields before the crop plants have come up.

Motor vehicle *drivers* who drive at a steady rate, at moderate speeds, and accelerate gradually get the best mileage from the gasoline used.

People who cut timber without permission on land not their own are called *"grandmawers"* in the Ozarks, the mountain area of Missouri and Arkansas.

Railroads carry approximately 70% of America's *freight;* the rest is carried by trucks, inland water boats, pipelines and aircraft.

The towering Empire State Building in New York City is being used in research on *lightning;* it is struck by lightning many times each summer, often as frequently as 48 times.

The *Stillingia tree,* also known as the Chinese tallow tree, grows in the southwestern part of the United States, including Texas, and produces an oil-bearing seed which yields an oil suitable for use in paints and varnishes.

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my sister with a brick and felt bad."

Between 12 and 18, school failure, being refused desired objects, loss of friends, quarrels with parents, breaking up with boy friends, inferiority feelings, seeing accidents and lack of popularity were among the most often remembered.

Reporting their findings in the JOURNAL OF GENETIC PSYCHOLOGY, the scientists suggest that the 6- to 12-year group may be forced to adapt too rapidly to social rules and conventions. Problems of the older group, they believe, may be partially blamed on "the educational, social and economic philosophy" of today. Parents and teachers ought to do more to build up a youth's sense of personal worth in this stage, the investigators urge.

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CHEMISTRY-PHYSICS

Non-Radioactive Tracers

► A RADAR research discovery during the war now makes it possible to trace chemical elements in some parts of the body without the use of hazardous radioactive isotopes.

The microwave spectroscope uses waves of the same length as radar to detect even tiny amounts of chemical elements.

Stable isotopes of elements, which differ only in atomic weight from the usual form of the element, can be fed to humans, animals or plants. The element may end up in the skin, hair or nails of an animal being tested, or in any part of a plant. It must be in some part that is detachable to be traced since the spectroscope can only be used on a small specimen. The part being tested is placed in the spectroscope where it will intercept microwaves and cancel out those frequencies corresponding to the isotopes of elements it contains.

Development of the microwave spectroscope is the result of work done at the Research Laboratory of Electronics of the Massachusetts Institute of Technology.

Radioactive isotopes which have been used to trace the distribution of elements and compounds in living organisms have a much wider range of uses than the stable isotopes. However, these isotopes are dangerous to life if given in too large amounts. Radioactivity poisoning, which causes burns and in larger doses, disintegration of cells, might result.

Radioactive isotopes are also more expensive. They are used in such experiments because they can be traced with a Geiger-Muller counter.

Microwave research began during the war when scientists working on radar discovered that certain wavelengths used in radar were absorbed by gases in the atmosphere. At the Radiation Laboratory at M. I. T. and at Columbia University, projects were started to find out what gases interfered with what wavelengths. It was found that water vapor and oxygen absorbed microwaves in such a way that they defined the limits of usable radar waves.

After the war these discoveries led to work in the detection of gases by microwave spectroscopy and from there to the use of these waves in exploring matter.

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CHEMISTRY

Chemists' Newer Methods

► CHEMICAL INDUSTRY is using cool and quiet processes to replace the fire and brimstone that are the traditional accompaniments of the chemist, the magazine CHEMISTRY says in its July issue.

Methods called catalysis and ion exchange are supplementing the refining by fire and the distillation by heat that have come to be associated with chemical processes. The editorial comment in this Science Service publication continues: Doubtless the flames, the smells and the noises issuing from primitive laboratories fostered the legend that the experimenter within had sold his soul to the devil.

Early chemists had few processes to work with. Through the verbal mists they created with their obscure language it is occasionally possible to make out the alchemists' directions and recognize the processes they were trying to carry out. The most surprising thing about them is the roundabout way they work.

Trained in metal refining, their work was all with fire. Solution and precipitation "in the wet way" was still undreamed of.

It was an important step ahead when the alchemists discovered distillation. The process must have seemed mysterious to them, and absurdly simple.

In the same way, today, old fogies may still be found who scoff at new methods which take advantage of small surface forces—catalysis and ion-exchange. "What's so wonderful," they ask, "about just running a solution through a pipe?"

The steps in development of chemical industry are not unlike those in the development of machine design. As the creaks and bangs of primitive machines have been replaced by the purr of the modern motor, the violence of early chemical processes is being superseded by methods which take advantage of quieter forces.

Catalysis often persuades chemicals into combinations that heat and pressure can scarcely force them into. Ion exchange accomplishes, seemingly without effort, what distillation, with its expensive energy changes, balks at.

Soon photosynthesis will join the list of methods which will replace the alchemists' Little Tophet with a chemical factory as quiet and restful as nature's factory, the cool green forest.

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The age of *wild quail,* a favorite game bird in much of the United States, can be quite accurately told by experts from their size and their feather developments.

Some American cities are washing *streets* with a mixture of one gallon of a commercial detergent made from petroleum added to each 2,000 gallons of water; the application leaves a thick layer of foam on the surface which lasts for 30 minutes.

PUBLIC HEALTH

Your Handkerchief Enemy

Scientists estimate that a used handkerchief is probably the most important single method of spreading germs. Best aerial disinfectants appear ineffective.

➤ YOUR HANDKERCHIEF is a powerful weapon of germ warfare.

A scientific estimate is that your handkerchief can unleash a bombardment of 136,000 germ particles.

This is the average for 211 handkerchiefs which were scientifically shaken by a group of British scientists. They shook the handkerchiefs mechanically and by hand. "Gentle manipulation" of a used, dry handkerchief will distribute an average of 15,000 particles and as many as 50,000, they found.

Even more alarming was the discovery that common aerial disinfectants do not kill these germs.

The handkerchief experiments were made at Harvard Hospital, Salisbury, and are reported in the British journal, THE LANCET (July 31), by K. R. Dumbell, J. E. Lovelock and E. J. Lowbury.

In the experiment, they used cotton handkerchiefs which had been issued to volunteers and used two days. The handkerchiefs were shaken in a special room with an air blower. The air blower proved to be five times as effective as handshaking of the handkerchiefs.

When the scientists discovered the huge particle count, they tested the germs with the "best available" aerial disinfectants. Three chemicals and ultraviolet rays all failed to kill the germs under normal conditions.

Using your handkerchief, the scientists conclude, is probably the most important single method of spreading germs, with the possible exception of bed-making. Talking and nose-blowing, they add, probably contribute few germ particles.

The real villain is your handkerchief.

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MEDICINE

Cure for Abscesses

➤ A PAINLESS CURE for abscesses which leaves no scars is reported by Dr. Harry J. Cohen of New York in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 21).

Pus is drawn from the abscess with a large needle to which a syringe is attached and replaced with approximately the same amount of penicillin solution. No bandages are required.

This procedure was first tried on a newborn infant with abscesses covering the entire back, buttocks, abdomen, thighs and legs treated at the Harlem Hospital. The child had a fever, and abscesses continued to form after 11 days of treatment with sulfonamide drugs. The accepted procedure of puncturing the abscesses to allow drainage was impractical because the whole body was involved which would create a problem with dressings and nursing care.

First, 10,000 units of penicillin were injected into the muscles every three hours until the child's temperature returned to normal, after two days. Then each abscess that had become soft was treated by replacing the pus with penicillin. One such treatment was sufficient to heal the abscess. In three weeks the infant was entirely well with no scarring of the body.

Fifteen other children with abscesses of various parts of the body were cured by this method, Dr. Cohen states.

Advantages of the new treatment to the pediatrician, Dr. Cohen points out, are: treatment can be given in the office or home; anesthesia is unnecessary as it is painless; it eliminates the need of dressings which are difficult to keep in place and, depending on the site of the wound, difficult to keep from getting contaminated by body wastes; it facilitates nursing care; and it prevents scar formation which is important when the infection is on the face or neck.

This treatment has been used in other conditions marked by infected cavities, including acute osteomyelitis, inflammation of the bone.

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BIOCHEMISTRY

Ultraviolet Rays Hinder Food Production in Fungi

➤ ONE-CELLED green plants were deprived of their power to make their own food by irradiation with short-wave ultraviolet, in experiments performed at Yale University by Edwin A. Davis. Strains of their offspring showed themselves permanently handicapped in this way; they could survive and reproduce only when supplied with ready-prepared foods, practically as if they were fungi. As the supply of glucose was depleted they lost their color, but regained it when fresh glucose was added.

There is a certain irony in the plight of this microscopic green plant that is unable to use its chlorophyll in the natural way, for its botanical name is Chlorella, which translates as "little green one."

Although Mr. Davis' study was conducted solely with an eye to learning more about the biochemistry of chlorophyll and its action, there is a possible point of interest in it for students of plant evolution. It has long been supposed that fungi, which must find their food ready made, were once self-supporting algae, properly equipped with chlorophyll. This study gives a hint of how the shift from green independence to pallid dependence may have started.

Mr. Davis' results are reported in the journal, SCIENCE (July 30).

Science News Letter, August 28, 1948

WILDLIFE

Expedition Will Study Strange Animals and Birds

➤ THE HIGHLAND FLOWER MOUSE, somersault-turning ratel, white-faced wagtail and the blue-bearded bee eater are not characters out of fairy stories. They are animals and birds that really exist in the little-known kingdom of Nepal which lies between India and Tibet and will be investigated by an expedition sponsored by the National Geographic Society, Yale University and the Smithsonian Institution.

The highland flower mouse is a sort of rodent, somewhat like a rat, which lives in grass nests in the hollows of decayed trees. The somersault-turning ratel is also called the honey badger. It is a form of mammal related to the bear. Both the white-faced wagtail and the blue-bearded bee eater are birds.

Nepal has been known chiefly as the source of the British Empire's fighting Gurkas and as a famous hunting region. A great variety of animals live in its high grass and jungles, including the elephants, tigers, wild oxen and the great one-horned rhinoceros. Only lately has Nepal entered into diplomatic and direct trade relations with the United States. The new Maharaja of Nepal, Sir Mohan Shum Shere Jung Bahadur Rana, has given his personal approval to the expedition.

Dr. Dillon Ripley, Yale University zoologist, will head the expedition which sails from Seattle, Wash., Sept. 15.

Science News Letter, August 28, 1948

AERONAUTICS

North Pole Is Air Center

➤ THE NORTH POLE is the center of the world of a strategic air force of the present day, the annual report of the U. S. Air Force indicates. This area extends southward to about 30 degrees north latitude.

This includes all the United States except the southern tip of Florida and a bit of Texas, includes all of Europe, a little of North Africa, and Asia except the nations on the Indian ocean and the South China sea. Japan is within it.

The shortest air route between central United States and the Urals, between Alaska and Germany, or between Greenland and Japan lies directly over the polar region, the report states. Although the polar ice cap is impossible to ships or surface forces, it offers no barrier to aircraft flying above it. The cap of the world from the 30th parallel to the North Pole is the world of air power.

Within this area are eight great industrial areas which are today of sufficient productivity to be significant factors in a full-scale war. These centers are Japan, central Siberia, the Ural Mountains, Moscow, the Don Basin, western Europe, the British Isles, and northeastern United States. The main targets of military air power in a war are industrial: oil refineries, steel mills, engine factories, electric power plants, aluminum smelters, or whatever may be important to military effort. From them flow the arms and weapons, the fuel and ordnance, and everything necessary to maintain fighting forces.

American national defense can not rely solely on interceptor fighters and anti-aircraft ground installations to defend approaches from the Arctic. It must include, the report asserts, craft that can answer aerial aggression with a smashing retaliatory attack. America must have aircraft that can operate effectively under the climatic conditions of the Far North.

There also must be available to that defense force a system that will warn of an approaching attack in time to take counter measures. It would include adequate intelligence with early warning radar devices. Then there must be a long-range striking force with aircraft that can make non-stop round trips from American bases across the polar route to an enemy's industrial installations and back to their stations.

Science News Letter, August 28, 1948

MINERALOGY

Sufficient Liquid Fuels

➤ FUEL OIL for home and other heating, and gasoline for cars and power, will probably be sufficient to meet all essential needs during the coming winter months providing reasonable precautions are taken to use wisely the available supply.

The oil industry today is refining 111 gallons of crude oil for every 100 gallons it processed a year ago. This means an 11% increase in supply. The total processed each day at the present time is more than 237,000,000 gallons. Demands, however, have increased during the year. There are now more home oil-heaters, farm tractors, motor vehicles, diesel engines and diesel locomotives than ever before in the history of liquid fuels.

The reasonable precautions that can be taken by the ordinary car owner and home owner are concerned mostly with keeping the mechanical equipment in which the liquid fuels are used in good condition.

This means for the automobile, properly adjusted carburetors and ignition, clean spark plugs and tire inflation. It means also avoiding unnecessary driving, "jack rabbit" starts, high speeds, engine racing, and running engines while parked.

In the home, it means having the oil heater serviced by an expert to see that it is in proper condition for efficient functioning. At the same time, the building itself should be checked so that the heat generated by the furnace is not wasted into the great outdoors. Window stripping, storm windows and doors, and wall insulation save heat. Cracks and crevices are excellent "heat exchangers" and, in the interest of liquid fuel saving, should be closed before the furnace is put into use.

For the most of the United States, the oil industry is of the opinion that sufficient liquid fuels will be available to meet essential needs unless military demands greatly increase. There may be some tight spots and temporary shortages, but not of serious proportions, it states in a recent report by the Oil Industry Information Committee of New York. Shortages are more apt to occur in the Middle West, the report indicates, because much must be brought into that region by tank cars. Pipeline distribution to this area has been handicapped by a shortage of materials, including steel.

Science News Letter, August 28, 1948

WILDLIFE

Find African Big Game No Longer Run in Herds

➤ ELEPHANTS and other big game animals in Africa no longer seem to run in big herds.

This is the conclusion of Dr. James L. Clark of the American Museum of Natural History in New York. Dr. Clark was leader of the Museum's Central African Expedition which has just returned to this country.

He said that big game seems to be fairly plentiful. But the animals are not found in herds as they once were, except in the game preserves and national parks in Africa.

The expedition was more interested in insects than big game, but it found some giants of the insect world. Huge termite queens, four inches long, are among the specimens brought back by Dr. Neal A. Weber, associate professor of zoology at Swarthmore College and a member of the expedition.

Science News Letter, August 28, 1948

PUBLIC HEALTH

Girls Born Today Have Life Expectancy of 70

➤ WHITE GIRLS born today can expect to live to be 70; boys to reach the age of 65.

This new high of 67 years as the average life expectancy for people in the United States was reached in 1946, latest year for which complete figures are available, reports the National Office of Vital Statistics of the Public Health Service. Preliminary figures for 1948 indicate that the average length of life today is about the same or just slightly lower than it was two years ago.

A baby born today can be expected to live almost a whole year longer than if he or she had been born in 1945, and nearly two years more than if born in the prewar years of 1939-41. The life expectancy of babies today is over 17 years longer than that prevailing at the turn of the century.

The number of years left to a child of 10 today depends both upon sex and race. White boys on the average will live another 58.3 years, white girls another 63 years. Non-white children usually do not live as long, boys averaging another 51.9 years, girls another 54.8 years more.

Young men of 20, if white, have an average remaining lifetime of 49 years, girls one of 53.4 years. Males of 40 may expect to enjoy about another 30.9 years of life, females another 34.8 years. White men of 60 on the whole have 15.6 years more to life, women of the same age 18.1 years more.

But for people reaching the age of 65, non-whites have a longer average lifetime left them than whites. At 65 and 70, this difference amounts to but a few weeks or months. But for people who reach 75, it adds up to a year or so.

White men of 75 may expect to live another 7.7 years, white women another 8.6 years; non-white men on the average have left to them the same number of years as white women, and non-white women may expect another 10.5 years of life.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publications direct from issuing organizations.

ADVANCES IN BIOLOGICAL AND MEDICAL PHYSICS, VOLUME I—John H. Lawrence and Joseph G. Hamilton, Eds. — *Academic Press,* 484 p., illus., $8.60. Discussing the use of radioisotopes in medical research and the protection of workers and others against injury from radioactive materials and the atomic bomb.

FIRST LOVE — Joseph Greene and Elizabeth Abell, Eds.—*Bantam,* 242 p., paper, 25 cents. A collection of stories by well-known authors. A book for young people wondering what first love is like and for their elders who like to be reminded. The tales seem to say, as the editors comment "that there might be clearer, straighter, less chancy ways of first encounter."

FLAK BAIT: The Story of the Men Who Flew the Martin Marauders — Devon Francis — *Duell,* 331 p., illus., $5.00. "Flak Bait," was the name of a bomber which flew 202 combat missions and was hit by flak 1,000 times. But it was also a symbol.

THE INSECT GUIDE: Orders and Major Families of North American Insects—Ralph B. Swain —*Doubleday,* 261 p., illus., $3.00. An authoritative work, beautifully illustrated in black and white and full color by SuZan Swain.

AN INTRODUCTORY COURSE IN COLLEGE PHYSICS —Newton Henry Black—*Macmillan,* 3d ed., 800 p., illus., $5.00. Preserving the historical order with simple machines treated in the first chapter; atomic fission in the last.

JOHN GOFFE'S MILL — George Woodbury — *Norton,* 245 p., $3.00. The delightfully written account of how a "reformed professor," anthropologist of a museum, rebuilds his inherited mill and its industry along with his own life.

NATURAL SCIENCE THROUGH THE SEASONS: 100 Teaching Units—J. A. Partridge—*Macmillan,* 520 p., illus., $3.00. A text for all grades from one to eight which contains lots of practical "how-to-do-its" and experimental material. By a Canadian author.

NATURWISSENSCHAFTLICHE RUNDSCHAU, VOLUME 1, NUMBER 1—H. W. Frickhinger, Ed.— *Wissenschaftliche Verlagsgesellschaft,* 48 p., illus., quarterly, 6 DM per year, 2 DM per copy. A new magazine devoted to scientific news.

PRINCIPLES FOR PUBLIC ACTION ON PROBLEM DRINKING: A Guide to Model Legislation— *Research Council on Problems of Alcohol,* 16 p., paper, 15 cents.

THE STARS ARE YOURS—James Sayre Pickering —*Macmillan,* 264 p., illus., $3.95. A book for laymen introducing our nightly companions in the heavens.

A TEXTBOOK OF HISTOLOGY — Alexander A. Maximow and William Bloom — *Saunders,* 5th ed., 700 p., illus., $8.50. A well-known text revised and with new illustrations.

THE TRES ALAMOS SITE ON THE SAN PEDRO RIVER, SOUTHEASTERN ARIZONA—Carr Tuthill — *Amerind Foundation,* 88 p., 36 pl., paper, free to universities and graduate anthropologists on request direct to Amerind Foundation, Dragoon, Ariz.

WOOL WAX—D. T. C. Gillespie—*Hobart Publishing Co.,* 94 p., paper, $5.00. Reporting research at the Australian Council for Scientific and Industrial Research on the uses and derivatives of this byproduct of the wool industry.

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PSYCHOLOGY

Ant Is Made Neurotic By Frustration

➤ ANTS, like their larger four-legged and two-legged kindred, may "get the jitters" if they run into a situation that is too much for them. The story of such a neurotic ant is told in the journal, NATURE (July 10), by Dr. Derek W. Morley of the Institute of Animal Genetics in Edinburgh.

Dr. Morley maintains a colony of ants in his laboratory. To test their intelligence he puts them through a maze, similar to the larger apparatus used with rats and other mammals.

One time he put one of the most intelligent of his ants back into the maze within five minutes after she had successfully completed a run through it. This time she lost her way and presently was in a dead-end alley.

Instead of immediately retracing her steps and trying to find the right path, the ant remained at the dead end, feeling around the three walls and showing continually rising excitement. Especially noticeable symptoms were jerkiness in movements of legs and antennae.

Finally she faced the other way, but seemed to have lost control of herself. With her legs still jerking, she staggered around backwards in a circle.

Dr. Morley rescued her, ran cold water over her for a few seconds, and then put her back into the nest, where she soon recovered and ran around normally.

Science News Letter, August 28, 1948

ENGINEERING

Use Surplus Gas Turbines For Coal-Burning Tests

➤ TWO AMERICAN gas turbine engines, one of which was once destined for Russia under the lend-lease program, are now to be used in this country in conducting two notable experiments in the coal-burning field.

The first is in connection with the use of pulverized coal as a fuel for gas turbine locomotives. The second is in the use of gases for fuel which are obtained by burning underground thin layers of coal just as they occur in nature.

These two gas turbines now belong to the U. S. Bureau of Mines. They were obtained from the War Assets Administration after being declared surplus by the State Department. The one which was to be shipped to the Soviet Union is a 40,000-cubic-feet-per-minute unit. The other is a 23,000 c.f.m. turbine, and it is this one which will be used with the underground burning of coal experiment.

The gas turbine engine, now becoming more popular in America and other countries because of its efficiency, is similar to the steam turbine but utilizes gases of combustion under high pressure against the vanes on the shaft of the engine to cause its rotation. High-pressure steam is used in the steam turbine. One great advantage of the gas turbine is that it requires no water. Therefore it can be used where water is scarce, in desert country and in mines, and it can be used in locomotives.

The larger of these two units is to be located at Dunkirk, N. Y., in a laboratory of the Locomotive Development Committee of the Bituminous Coal Institute. Scientists of the organization, working at Baltimore and using funds provided by a group of American railroads, have already successfully used pulverized coal as fuel to operate a gas turbine. Two locomotives are now under construction which will be powered by coal-burning gas turbines. The use of this turbine will further the studies of the scientists.

The experiment in burning bituminous coal as it occurs in underground seams is being conducted at Gorgas, Ala., by the U. S. Bureau of Mines and the Alabama Power Company in collaboration this year for the second time. Holes are drilled down through the coal seam, and an incendiary is dropped into one. Constant air pressure is then applied to support combustion. Gases formed are recovered from the other drill holes. They are suitable for firing a furnace or can be used to make synthetic liquid fuels.

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• New Machines and Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 429. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *UNIVERSAL TELEVISION receiver operates on alternating current of any frequency and on direct current as well, eliminating the need of special converters in DC areas. The new receiver is a table model with a seven-inch direct-view video screen, containing 17 television tubes plus one rectifier tube.*

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❁ *ASBESTOS-BASED TAPE, for electrical insulation, has high insulating strength and is suitable for use where high temperatures are encountered. The non-inflammable paper-like tape can be brought to bright red heat in a Bunsen burner without igniting or melting and, in use, is unaffected by high temperatures for long periods.*

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❁ *COPY-ROLL kit is a new photo-copying unit with complete processing facilities and tiny self-contained dark room compactly arranged in a carrying case of suitcase size. It will produce letter- and legal-size photo-exact facsimiles of anything written, typed, printed, drawn or photographed in a matter of minutes.*

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❁ *INFLATABLE DRESS FORM, for the home dressmaker, can be made to take the shape of an individual by a little padding here and there, a tape around the waist, and perhaps the person's own brassiere on the bust. The plastic form, shown in the picture with a net-jersey cover to hold pins, may be deflated for storage.*

Science News Letter, August 28, 1948

❁ *DRAWING AID for engineers and draftsmen is a square plate of cellulose nitrate plastic with cut-out circles which makes it possible to draw accurately standard bolts, nuts, hex head cap screws and similar machine parts without the use of a compass.*

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❁ *SOLID TIRE for factory-truck use is made of rubber with a soft inner section to provide greater cushioning effects. Its tough, long-wearing rubber tread, that resists cutting and chipping, together with the soft center, permits the truck to pass safely over obstacles with little jar to the load.*

Science News Letter, August 28, 1948

❁ *CONVERTIBLE CRIB for the infant becomes a chair, with back and foot-rest, and a table for toys when the sleeping pad is removed and the sectional bottom dropped. Casters under the four legs on the non-tipping device permit it to be rolled from room to room.*

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• Nature Ramblings *by Frank Thone* •

➤ CIVILIZATION, we are told, first came into existence in the valleys of great rivers —the Nile, Tigris-Euphrates, the Indus, the Yangtse. Even now, our great cities are built by the waterside—New York, Chicago, New Orleans, Buenos Aires, London, Paris, Rome, Alexandria, Calcutta, Shanghai.

Yet only one of man's major crop plants, rice, is a wet-land plant. All our other cereals, all our principal root crops, most of our vegetables and all our fruit trees demand well-drained soils. Some of them, like barley, will even tolerate a considerable degree of drought. One other extensive culture area, Polynesia, depended on the mud-loving taro for its favorite food, poi; but this region is mostly made up of small islands, supporting a relatively small population. A variety of taro, the dasheen, has been introduced into our own South, but has not yet become a major crop.

Yet there are millions of wet acres, even in the world's most crowded and hungriest lands, that are not exploited for food, at least directly. They produce starchy-rooted plants like cattail, lotus, waterlily and arrowleaf. It would seem at first glance that this stored starch might be made use of industrially if not for food, but no great success seems to have attended experimental efforts in that direction so far.

Wasting Wet Acres

The only answer that man seems to have devised to the challenge of these deeply fertile but too-wet lands is to drain them and then plant his conventional upland crops. There is no question that newly drained muckland produces bounteous and profitable harvest, at least in the beginning. But the soils are exceedingly light and friable, so that a relatively short course of cultivation wastes them away. A decade of such farming can destroy the muck that has been centuries in the making. Worse still, such soils are often so full of decomposed vegetable matter that they take fire and burn to ash, right down to the lowered water-table.

It would seem to behoove those who concern themselves with long-range planning for land use to think of ways in which wet or submerged lands can be induced to yield food for man's crowding millions without having to undertake, first the heavy expense of draining, then the risk of quick destruction of the soil's too-rashly exposed riches.

Science News Letter, August 28, 1948